The Fruit Variety and its Environment

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OF THE thousands of fruit varieties that have been named and described, experience has eliminated all but a few. Most of those now propagated in America are grown commercially, some of them profitably, in some environmental complexes. Besides soils and rootstocks, some of the environmental features that may determine the suitability of a deciduous variety for a situation are (1) temperature in the coldest winter, spring or autumn nights; such nights preclude successful commercial orchard culture from much the largest part of the United States and Canada, and influence the choice of varieties in some areas; (2) length of the frost-free period; (3) summer temperature and humidity; (4) number of hours of winter temperature as low as 45°F or lower; (5) undetermined influences; (6) competition and (7) enemies.

These influences are not always exerted separately. At high latitudes with short summers, for example, autumn frosts may remove the leaves before they have made their full contribution toward eventual cold resistance of the wood and buds. Or in districts where spring frosts preclude commercial growing of most varieties there are rather good apple varieties that blossom late enough to avoid frost damage. But these are unprofitable because of competition with somewhat better fruit of varieties grown in more nearly frost-free districts.

At high latitudes many varieties cannot be grown in parts of Norway and Sweden, even though the temperature during the coldest winter nights is not low enough to damage the trees. The summers are not long enough for their fruit to ripen.

The flavor of some kinds of fruit varies with latitude. For example, at latitude 38° to 39° in Missouri, Red Astrachan apples are too sour to be pleasant to most of us, while at latitude 43°, in New York, the same variety is milder and rated an apple of high quality; and at latitude 59° in Sweden it seemed to me a most delicious apple. Is this richer flavor due to cooler summers at high latitudes, to longer summer days, or to undetermined influences?

Even among varieties that ripen well at high latitudes, different ones respond differently to latitude. McIntosh apples seem to have better flavor with increasing latitude, and are at their best in the Lake Champlain region. But fruits of its parent, Fameuse, seem to have their best flavor still farther north in Canada. Again, is this due to lower summer temperature, to longer summer days, or to undetermined influences?

Some experimental evidence suggests that the poorer quality of sour cherry fruits when grown at latitudes as low as 36° to 38° is due to the heat, to higher respiration and depletion of sugar. Altitude also influences flavor (and color). Mountain fruits of many varieties at least tend to have especially rich flavor. Apple varieties that have dull, woody flavor when grown in the interior valleys of California may be delicious when grown at several thousand feet elevation in adjacent mountains. As far as my knowledge and thinking go, this effect on flavor is due to undetermined influences.

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Apples of varieties that will fruit well in southern California have rather good flavor in cool, fairly humid coastal districts, but are woody and nearly flavorless when grown in the hot, dry interior valleys. Is this difference a response to heat or to intense sunlight and dry air (large daily water deficits)? Since at about the same latitudes in humid regions east of the Rocky Mountains fruit of these varieties do not have this dull flavor, I think much of it may be due to the high daily water deficits in the dry hot air. Some varieties such as White Pearmain do not have their flavor impaired so much by being grown in these hot, dry districts. And Bartlett pears grown in these same hot, dry districts have the best flavor and the best market quality of any that I have seen. Yet I have never tasted a Bosc pear grown in these districts whose flavor approached that of Bosc pears grown in cooler, more humid New York.

Elberta peaches seem to me to have their best flavor when grown in such hot districts and certainly have very poor flavor in cool coastal districts. Both Elberta and J. H. Hale peaches grown in the coolest parts of the area around San Francisco Bay are too bitter to be eaten. Yet fruit of Peregrine and of some other varieties have good flavor when grown there, although not as good as when grown in somewhat warmer air.

In districts where winters are as warm as those in coastal districts of southern California, with considerably less than 1000 hours at temperatures of 45°F or lower, nearly all varieties of deciduous orchard fruits except figs and Oriental persimmons are highly unsatisfactory. Very small differences in winter temperature may make the difference between fair growth and fruiting and less than an inch of shoot growth, and no fruiting.

A few varieties of most deciduous fruits other than the cherry do fairly well after such warm winters. And a small percentage of seedlings from varieties with chilling requirements too great for this district may do fairly well there. Again responses are somewhat complicated. Twig temperatures of 113°F in spring or early summer may assist in breaking the rest period, so that in hot interior districts, trees of a variety may grow and fruit fairly well after winters of unsufficient chilling. Such mild winters would cause trees of the same variety to be weak and unfruitful if the twigs in springs and early summers were cooler, because of lower air temperature or less intense sunlight.

Northeast Regional Plant Introduction Station

A Northeast Regional Plant Introduction Station was established in 1953 at Geneva, New York, the fourth of its kind to be established in this country. It serves the twelve states that make up the region. Dr. A. J. Heinicke serves as the Station's Administrative Director, Dr. A. F. Yeager is chairman of the Technical Committee, and Dr. D. D. Dolan is secretary of the Technical Committee and Regional Coordinator.

The purpose of the Plant Introductions Station at Geneva, and that of the other three stations, is to evaluate, propagate, and disseminate plant materials, including fruits, collected from foreign countries by the United States Department of Agriculture. It is also charged with the preservation of germ plasm of commercial importance in the region.